UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

4060-3

ESTABLISHMENT RECORD

FOR

SIMS PEAK POTHOLES RESEARCH NATURAL AREA

ASHLEY NATIONAL FOREST

UINTAH COUNTY
UTAH

☆ U.S. GOVERNMENT PRINTING OFFICE: 1983 - 425-976 - 415/6115

FS-6200-7 (10/73)

DECISION NOTICE/DESIGNATION ORDER

Decision Notice
Finding of No Significant Impact
Designation Order

By virtue of the authority vested in me by the Secretary of Agriculture under regulations at 7 CFR 2.42, 36 CFR 251.23, and 36 CFR Part 219, I hereby establish the Sims Peak Potholes Research Natural Area. It shall be comprised of lands described in the section of the Establishment Record entitled "Location".

The Regional Forester has recommended the establishment of this Research Natural Area in the Record of Decision for the Ashley National Forest Land and Resource Management Plan. That recommendation was the result of an analysis of the factors listed in 36 CFR 219.25 and Forest Service Manual 4063.41. Results of the Regional Forester's analysis are documented in the Ashley National Forest Land and Resource Management Plan and Final Environmental Impact Statement which are available to the public.

The Sims Peak Potholes Research Natural Area will be managed in compliance with all relevant laws, regulations, and Forest Service Manual direction regarding Research Natural Areas. It will be administered in accordance with the management direction/prescription identified in the Establishment Record.

I have reviewed the Ashley National Forest Land and Resource Management Plan (LRMP) direction for this RNA and find that the management direction cited in the previous paragraph is consistent with the LRMP and that a Plan amendment is not required.

The Forest Supervisor of the Ashley National Forest shall notify the public of this decision and mail a copy of the Decision Notice/Designation Order and amended direction to all persons on the Ashley National Forest Land and Resource Management Plan mailing list.

Based on the Environmental Analysis, I find that designation of the Sims Peak Potholes Research Natural Area is not a major federal action significantly affecting the quality of the human environment.

This decision is subject to appeal pursuant to 36 CFR Part 217. A Notice of Appeal must be in writing and submitted to:

The Secretary of Agriculture
14th & Independence Ave., S.W.
Washington, D.C. 20250

and simultaneously to the Deciding Officer:

Chief (1570)
USDA, Forest Service
P.O. Box 96090
Washington, D.C. 20090-6090

This Notice of Appeal prepared pursuant to 36 CFR 217.9(b) must be submitted within 45 days from the date of legal notice of this decision. Review by the Secretary is wholly discretionary. If the Secretary has not decided within 15 days of receiving the Notice of Appeal to review the Chief's decision, appellants will be notified that the Chief's decision is the final administrative decision of the U.S. Department of Agriculture (36 CFR 217.17(d)).

Chief

Date

SIGNATURE PAGE

for

RESEARCH NATURAL AREA ESTABLISHMENT RECORD

Sims Peak Potholes Research Natural Area

Ashley National Forest

Uintah County, Utah

The undersigned certify that all applicable land management planning and environmental analysis requirements have been met and that boundaries are clearly identified in accordance with FSM 4063.21, Mapping and Recordation, and FSM 4063.41 5.e(3) in arriving at this recommendation.

Prepared by Nicholas S. Van Pelt Date July 5, 1990
Joel S. Tuhy, Utah Natural Heritage Program
Nicholas S. Van Pelt, The Nature Conservancy

Recommended by Mary A. Wagner Date 10/1/90
Mary A. Wagner, District Ranger, Vernal Ranger District

Recommended by Duane G. Tucker Date 2/11/91
Duane G. Tucker, Forest Supervisor,
Ashley National Forest

Recommended by John D. Lupis Date 3/1/91
for J.S. Tixier, Regional Forester, Intermountain Region

Recommended by R. Duane Lloyd Date April 91
for Laurence E. Lassen, Station Director,
Intermountain Research Station

ESTABLISHMENT RECORD FOR

SIMS PEAK POTHOLES RESEARCH NATURAL AREA

WITHIN ASHLEY NATIONAL FOREST

UINTAH COUNTY UTAH

INTRODUCTION

The Uinta Mountains are a large, east-west trending range located in northeastern Utah (Map 1). They encompass a great range of floristic and vegetal diversity. Vast expanses above timberline are flanked by subalpine and montane coniferous forests, meadows, lakes, and streams. The range's many perennial drainages descend through xeric woodlands to the shrub steppes of the adjacent basins.

Although still largely undeveloped, these mountains have supplied many resources for humans who have dwelt in the vicinity for centuries. The earliest, prehistoric peoples in the region developed a culture adapted to the arid climate of the basins. Theirs was a nomadic life with temporary campsites along routes where food and water were most easily obtainable. Later cultures employed similar techniques. Ute Indians occupied the region when the first Spanish explorers came through in the late 18th century. Fur trappers arrived in the 1820's, and trading posts and forts were built soon after. White settlers scouted the Uinta Basin in the 1860's, but did not stay permanently until the 1870's.

In historic times the Uinta Mountains have produced timber, water, summer forage, and at lower elevations, minerals for the use of valley settlers. The Ashley National Forest was created in 1908 and is responsible for managing non-mineral resources of the southern and eastern Uintas (T.G. Alexander 1987). In recent years, recreational use of the range (especially hiking, backpacking, camping, and fishing) has become much more important to the state and regional populace, requiring more attention in planning and management.

Concurrent with increased recreation and resource development (chiefly silviculture) has arisen a need to protect small areas of the Uinta Mountains as benchmark or reference areas. There are currently just three Research Natural Areas (RNA's) within the entire range. Until recently, the mode of "preservation" has centered on the often emotional issue of a High Uintas Wilderness. The Wilderness Congress created in 1984 is quite large, but it does not include important expressions of natural diversity in the mid- to lower elevations, outside of all proposals for expanded boundaries. Accordingly, it is necessary to seek undisturbed sites below about 10,000' (3000 m).

One site identified by the Forest Service as a potential RNA (USDA Forest Service 1982) lies a short ways east of the high, central core of the range (Photo 1). It is a trackless area of forests and potholes just north of Sims Peak (Maps 2 and 3; Photos 1 through 9). Reconnaissance inventories by Atwood (1982) and by Van Pelt (1983) found this site to be strongly qualified for RNA candidacy. Additional field and office work was undertaken in 1983 and has culminated in this Record. The integrity of this site provides an opportunity to recognize its principal and secondary features by designating it as the Sims Peak Potholes Research Natural Area (SPPRNA).

Land Management Planning

In response to Regional direction (Appendix A), the Ashley National Forest has identified the SPPRNA as a candidate Research Natural Area (USDA Forest Service 1986; and Appendixes B and C). Since adoption of the Forest Plan (Appendix D), the Forest has treated the included lands as an RNA even though an Establishment Record (ER) is still pending. The Environmental Impact Statement accompanying the final Plan (Appendix C) states (Table III-8) that an ER was completed. However, changes in the Forest Service Manual invalidated that Report and this version became necessary.

No Forest Plan amendment, nor any formal or informal public protest or appeal, has arisen in the intervening years that would affect the SPPRNA's candidacy for the establishment process. The area's current status and custodial management pending establishment were verified with Vernal Ranger District and Supervisor's Office personnel on March 1, 1990.

OBJECTIVES

The major objectives of the Sims Peak Potholes Research Natural Area are to preserve in an undisturbed condition varied and exemplary aquatic types, glacially-derived geomorphic features, and examples of a common commercial forest type. The SPPRNA will provide a highly accessible reference site for basic studies, a benchmark for assessing long-term ecological and hydrological changes, and a comparison area for determining effects of recreational activities and management techniques occuring in similar ecosystems (for example, R.R. Alexander 1987). Given the closed to semi-closed nature of the RNA's drainage, it may also be valuable for detecting the impacts of acidic deposition upon subalpine freshwaters.

JUSTIFICATION

A number of strong justifications exist for establishing the Sims Peak Potholes Research Natural Area. The two major categories to be discussed here are need and research potential.

An initial estimate of Research Natural Area needs in Utah (Van Pelt 1982; Table 28) mentions the following as a key need:

> "Aquatic and forest situations at low and mid elevations in the Uinta Mountains that would not be protected in a High Uintas Wilderness."

The proposed SPPRNA will help redress this deficiency, complementing the established Ashley Gorge, Gates of Birch Creek, and Pollen Lake RNA's. Specifically, the following recognized types and situations are represented in the SPPRNA:

1. The Abies lasiocarpa/Vaccinum scoparium (subalpine fir/grouseberry) forest habitat type.[1]

2. Aquatic-riparian situations (also known as "cells"):

   a. Kettle (or semi-drainage) lakes and ponds, with associated aquatic vegetation and wet-herbaceous vegetation (generally with species of Carex).

   b. Bogs, with associated wet-herbaceous vegetation (generally Sphagnum and Carex species).

   c. Freshwater marshes, with associated wet-herbaceous vegetation (generally Carex species).

   d. Wet meadows, with short Salix and herbaceous vegetation.

3. Geologic situations:

   a. Metamorphic rock type -- Precambrian quartzite.

   b. Glacial-origin geomorphic features -- lateral moraine and kettles.

Research Natural Area designation will thus protect an ecosystem complex that is evidently not represented in a High Uintas Wilderness, and which is also unrepresented in any RNA in Utah. Specific justifications with respect to the forests and wetlands are briefly discussed below.

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1. Scientific and common names for trees follow Little (1979). Names for shrubs, graminoids, and forbs follow Welsh and others (1987).

The subalpine fir/grouseberry habitat type (ABLA/VASC) is widespread and common throughout the subalpine zone of the Uinta Mountains. In the aggregate ABLA/VASC produces much timber and water. The forests of the proposed RNA are typical, although probably toward the lower end of the productivity spectrum associated with the type (Mauk and Henderson 1984, Appendix E-4). Approximately 400 acres (160 hectares) of the 500 forested acres (202 ha) in the proposed RNA support merchantable timber. Also, here the forests contain a greater proportion of Pinus contorta (lodgepole pine) and less Picea engelmannii (Engelmann spruce) than stands at higher elevations or with different fire histories. The forests of the SPPRNA have been excluded from the Ashley National Forest's suitable timberland base and from current timber-sale program alternatives (USDA Forest Service 1986, 1990).

As an RNA, the Sims Peak area will be valuable for representation of several aquatic and wetland types, all in a superb state of preservation. Some of these are widespread throughout the Intermountain Region. However, others are restricted to but fairly common in the Uintas, whereas still others are uncommon outside the RNA. Wetland types as are present in the SPPRNA have received scientific attention elsewhere (Briggs 1978; Jaktar and others 1979, Stutz 1951). At present such habitats are not represented in an RNA in Utah, although a bog lake is included in a botanical station in the western Uintas (Christensen and Harrison 1961).

The SPPRNA is highly accessible by road and then by foot (it is really too wet for horse or all-terrain-vehicle travel). It is thus more likely than remote protected areas, or the High Uintas Wilderness itself, to attract researchers, students, and monitors of environmental quality. A botanist, a forest ecologist, and an aquatic entomologist have all visited the RNA, offering endorsements of its candidacy and supplying basic information on its features (for example, Appendix E).

The Ashley National Forest's Analysis of Management Situation (USDA Forest Service 1982) calls for the determination of growth data for both natural and managed forest stands. The SPPRNA will be a good location at which to install temporary or permanent plots in a natural segment of the ABLA/VACA habitat type that is currently dominated by lodgepole pine.

The pristine potholes may be useful as monitoring stations for meteoric water quality. Virtually all the water in the potholes has fallen on-site, so it it far less subject to influence from humans, logging sedimentation, and livestock than where the drainage is largely surficial.

PRINCIPAL DISTINGUISHING FEATURES

The SPPRNA occupies the surface of a lateral moraine that is

derived from quartzitic parent material. The RNA has a hummocky topography, with many potholes scattered among low, timbered ridges made up of cobbly glacial till.

Well-developed forests grow on the upland till soils (Photo 9). These forests are representative of the subalpine fir/grouseberry (ABLA/VASC) habitat type, which is very common in the Uinta Mountains. At this elevation, lodgepole pine dominates the overstory. Engelmann spruce (Picea engelmanii) and subalpine fir are present and reproducing, but they are largely subordinate and less numerous in the overstory.

The potholes occur as scattered openings in the forest (Maps 3 and 4). No integrated surface drainage network exists among them. Drainage is overwhelmingly subsurface (and probably quite slow), dispersed through the porous glacial till. The majority of potholes are continuously wet, marshy, or boggy habitats. The vegetation of most of them is dominated by sedges (species of Carex.) Soils are predominately organic. A few linear openings in the forest are somewhat drier (and more passable on foot). They are more "meadowy" and support rich mixtures of forbs and graminoids (Photo 7). Soils of all the pothole variants are Histosols or Mollisols, the latter with fairly high clay percentages.

The wetlands here support a remarkable concentration of aquatic organisms (especially insects) that occur in Utah only in the Uinta Mountains (Appendix E). The mosaic of forests and potholes is also important non-winter habitat for big game, especially elk (USDA Forest Service 1990).

LOCATION

The SPPRNA is located on the Vernal District of the Ashley National Forest. It lies about 21 air miles (34 km) north-northwest of Vernal, in northern Uintah County, Utah (Maps 1 and 2). Geographic coordinates for the RNA's center are 40° 43′ North latitude and 109° 43′ West longitude.

The RNA is specifically located in parts of sections 13 and 24 of T. 1S, R. 19E, and in sections 17, 18, 19, and 20 of T. 1S, R. 20E, Salt Lake Meridian (Map 2). It is depicted on the northwestern part of the Taylor Mountain 7.5-minute US Geological Survey quadrangle.

Boundaries

Beginning at a point 50 ft. northeasterly from the centerline of the junction of two roads, said point is approximately N 54° W, 2,700 ft. from U.S.C. & G.S. Triangulation Station "SIMS", Latitude 40° 42' 54.516" North, Longitude 109° 44' 00.047" West, North American Datum 1927;

thence northeasterly approximately 1 mi., 50 ft. easterly from and parallel with the centerline of a road, to elevation 9,770 ft.;

thence approximately N 62° E, 1,500 ft. to elevation 9,640 ft. at a point which is N 12° E from "SIMS";

thence easterly approximately 5,200 ft. along elevation 9,640 ft. to a point which is N 50° E from "SIMS";

thence approximately S 59° E, 1,100 ft. to a point which is N 57° E, 7,650 ft. from "SIMS";

thence approximately S 10° W, 1,250 ft. to a point which is N 63° E, 7,000 ft. from "SIMS";

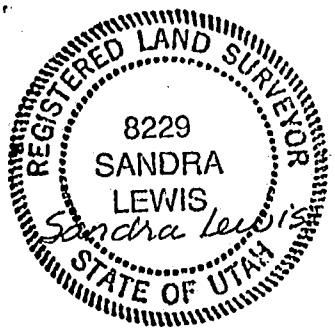
thence approximately S 7° E, 1,800 ft. to elevation 9,640 ft. at a point which is N 77° E from "SIMS";

thence westerly approximately 2,600 ft. along elevation 9,640 ft. to a point which is N 76° E from "SIMS";

thence approximately N 62° W, 1,950 ft. to a point 50 ft. northerly from the centerline of a road at a point which is N 66° E from "SIMS";

thence westerly approximately 1.1 mi., 50 ft. northerly from and parallel with the centerline of said road to the point of beginning.

I certify the enclosed boundary description of the Sims Peak Potholes Research Natural Area was prepared under my direct supervision.



Sandra Lewis — Forest Land Surveyor

3-12-91 — Date

The proposed SPPRNA encompasses an area of 650 acres (263 ha), all unreserved National Forest land. This figure is the same as that contained in the discussion of the area's candidacy in the final Ashley National Forest Plan (Appendix C, p. III-14).

Elevations

Elevation ranges from about 9970 feet (3050 m) along the western boundary, down to about 9610 feet (2930 m) along the area's eastern edge. This represents a gradual vertical range of 390 feet (120 m). The summit of Sims Peak, which affords a vantage of the RNA, stands an additional 352 feet (107 m) above the RNA's highest point.

Access

Approach to the area is easy for all types of vehicles, including passenger cars, during the snow-free season. The RNA is adjacent to Forest Road #018, the Red Cloud Loop, which can be travelled in opposite directions (see Maps 2 and 3):

1. From Vernal and Maeser, the route northwest up the Dry Fork becomes Road #018. It climbs out of Brownie Canyon and approaches the RNA from the south. Of the two access routes, this one is more likely to be slick and/or rutted after heavy summer or fall storms.

2. Road #018 intersects Utah highway 44, from Vernal or Manila, about 15.5 air miles (25 km) north of Vernal. Route #018 passes Kaler Hollow and Trout Creek Park, approaching the area from the east and north.

Once the area is reached, the rocky, unmaintained road along the southern edge of the RNA (Forest Road #036) is passable by higher-clearance two-wheel-drive vehicles, such as pickups. This provides the easiest access to the eastern half of the area, where pothole concentrations are greatest.

Foot travel within the SPPRNA is slow but not physically demanding. Dense lodgepole pine stands and downfall hinder progress in some spots, and sneakers or waterproof boots are necessary for any work in the wetland openings. There are few if any visual reference points (and no man-made markers) within the area. Visitors must therefore take care not to become lost in the

interior of the this trackless maze of forests and wetlands. However, by paying careful attention to maps and aerial photos, researchers should be able to reach and relocate any selected location in the natural area.

Compared to almost all other natural areas in Utah, the SPPRNA is unusually accessible for research, teaching, and observation. And, unlike many locations in the Uinta Mountains, access does not require a special vehicle, extended hiking, or pack animals. Shelter and potable water are readily available, in contrast with some of the more exposed, visited parts of the range. With advance permission, the Trout Creek Guard Station (Map 2) is often available to researchers needing overnight housing.

Maps

Various USDA Forest Service maps of the Ashley National Forest show the Sims Peak RNA vicinity, access routes, and Uintah Basin communities on one sheet (for example, Map 2). Despite the RNA's longstanding candidacy, its boundaries are not shown on maps for general distribution, including the Travel Plan for the Vernal Ranger District. Two Forest Plan technical maps do depict the boundaries:

1) The 3/8" to 1 mile Forest F.E.I.S. & Plan Map, whereon candidate Research Natural Areas are demarcated though not labelled. This map (in a pocket on page IV-60 of the Forest Plan) also shows 10-year timber project, road construction, and habitat improvement projects, plus other Plan delineations.

2) A 1/2" to 1 mile map of existing utility rights-of-way, utility "windows", designated corridors, and exclusion areas. Along with other (classified) RNA's, the Sims Peak Potholes RNA is depicted as an exclusion area, but it is not labelled as a Research Natural Area.

Photos

These three older black-and-white Forest Service aerial photos cover the SPPRNA, and in combination enable full stereoscopic coverage:

CENR-1-24, 25, and 26
Flown August 14, 1969
Scale: 1:15,840

The approved boundary has been fully delineated on frame 25, which also shows Sims Peak, the roads on the western and southern

sides, and "Big Pond" (Photo 2). Viewed in stereo, the boundary line is much easier to trace with reference to topography than on the Taylor Mountain 7.5′ quadrangle (Map 3). These photographs can be viewed in the Supervisor's Office of the Ashley National Forest, the Regional Office in Ogden, and (with boundaries drawn in) the Salt Lake City office of The Nature Conservancy.

Newer, color-infrared photographs at a smaller scale can be viewed in the administering Forest Service offices, but were not used in delineating the proposed boundaries.

AREA BY VEGETATIVE AND OTHER TYPES

Table 1 shows the estimated areas of the different vegetation types present in the proposed SPPRNA. Map 4 depicts their general distribution.

The continental classification devised by Kuchler (1966) would consider the coniferous forests as all of type 14, western spruce-fir forest (*Picea-Abies*). The Society of American Foresters (Eyre 1980) would identify them as cover type 218, lodgepole pine. This determination responds more to current conditions than the Kuchler scheme or that for Utah forest habitat types (Mauk and Henderson 1984). The habitat type present is clearly *Abies lasiocarpa/Vaccinium scoparium*, or ABLA/VASC.

None of these classifications adequately describe the herbaceous meadows and wetlands so pervasive in the RNA. Tremendous variation exists among these non-forested habitats (Photo 1 and Photos 3 through 8), which would not colonizable by trees except over very long timespans. This variation had to be ignored for purposes of mapping and areal estimation, because the distinctions cannot be discerned on aerial photographs nor mapped at a scale of 1:24,000.

Table 1. Estimated areas of vegetation types in the Sims Peak Potholes Research Natural Area.

Type	Estimated Area Acres	Hectares
Western spruce-fir forest Lodgepole pine cover type ABLA/VASC habitat type	500	202
Ponds, marshes, bogs, meadows	150	61
Total	650	263

PHYSICAL AND CLIMATIC CONDITIONS

Physical Conditions

The proposed SPPRNA is situated on a rolling, subalpine plateau just east of the core of the Uinta Mountains. Marsh and Leidy Peaks, which are the easternmost of the alpine summits over 12,000 feet (3660 m), lie about 5 miles (8 km) to the west (Map 2 and Photo 1).

The RNA itself occupies part of a lateral moraine deposited by a glacier which originated in the headwaters of the South Fork of Ashley Creek (Atwood 1909). The area thus exhibits a hummocky topography which is quite intricate on a small scale. Low, forested ridges of cobbly glacial till support forests of lodgepole pine. Scattered among the ridges are numerous small meadows and wetlands. These openings in the forest appear to be potholes or kettles (Hansen 1969), formed as depressions in the moraine when embedded ice blocks melted. The potholes display many stages of primary hydrarch succession, from open water to marshes and Sphagnum bogs to mesic meadows.

On a larger scale, the entire proposed RNA slopes toward the east-northeast at an average gradient of 5 percent. It is elevated above adjacent valleys, dropping off fairly steeply to the north (South Fork of Ashley Creek) and the south (head of Cow Hollow). No integrated surface drainage network has developed among the potholes; the majority of the drainage is probably subsurface.

Climatic Conditions

Climate in the general region, as in much of Utah, is influenced seasonally by two different weather systems. During the winter months, frontal storm systems move over the Uinta Mountains from the Pacific Northwest. Precipitation then is mostly as snow, and represents 65 to 70 percent of the total annual moisture received in the subalpine forest zone. Bitterly cold air masses periodically descend from the Arctic. Stagnant domes of high pressure may also persist over the region during the winter, at which times the mountains are often warmer than the flanking basins. During the summer months, this general region receives frequent orographic and convective thunderstorms from moisture originating in the Gulf of Mexico. These storms cover small areas but can be quite intense, with heavy rainfall and high winds.

Eight SCS precipitation stations are located in the general vicinity of the proposed SPPRNA. Data from these are summarized in Table 2 (USDA Soil Conservation Service 1979). Unpublished temperature data exist for the Mosby Mountain and Trout Creek SCS stations, spanning 1980 through 1987 (Table 3). The figures may not be indicative of long-term averages.

Table 2. Precipitation data from SCS stations near the proposed SPPRNA.

Station and Record Length	Distance from the SPPRNA	Elevation	Precipitation	
			Annual Avg.	June-Sept. Avg.
Ashley-Twin Lakes 1965-1978	4 mi to W 6 km	10500 ft 3200 m	35.30 in 897 mm	NA*
Grizzly Ridge 1965-1978	13 mi to E 21 km	8500 ft 2590 m	27.97 in 710 mm	8.38 in 213 mm
Kings Cabin (upper) 1954-1978	9 mi to E 15 km	8730 ft 2660 m	24.23 in 615 mm	7.80 in 198 mm
Mosby Mountain 1965-1978	11 mi to SW 18 km	9500 ft 2895 m	25.01 in 635 mm	7.48 in 190 mm
Paradise Park 1956-1978	11 mi to WSW 18 km	10100 ft 3080 m	28.16 in 715 mm	8.89 in 226 mm
Reynolds Park 1967-1978	10 mi to WNW 16 km	10400 ft 3170 m	31.31 in 795 mm	NA*
Trout Creek 1975-1978	3 mi to NE 5 km	9400 ft 2865 m	27.07 in 688 mm	8.30 in 211 mm
Windy Park 1965-1977	5 mi to NE 8 km	9400 ft 2865 m	25.80 in 655 mm	NA*

* Data not available.

Table 3. Temperature data from SCS stations near the proposed SPPRNA.

Station	Mean January		Mean July	
	°F	°C	°F	°C
Mosby Mountain	24.4	-4.2	58.6	14.8
Trout Creek	10.4	-12.0	43.5	6.4

DESCRIPTION OF VALUES

Flora and Communities

Two highly competent Forest Service botanists made extensive collections in the natural area during the summer of 1982 (Atwood 1982). Observations and additional collections were made by RNA inventory workers in 1983. Table 4 lists all plant species now known to occur within the proposed boundary. Scientific nomenclature follows Welsh and others (1987). Voluminous supplemental data (not reproduced here) will be archived showing the habitat of occurrence for those species observed in 1983.

The RNA contains no plants that are listed or proposed for listing as endangered or threatened. However, several species that grow here occur in Utah only in the Uinta Mountains, and are thus uncommon on a statewide basis. Such species include Carex lasiocarpa, Carex limosa, and Potentilla palustris. The 1983 collection of P. palustris represented a new state record; thus far Sims Peak Potholes and nearby Lily Pad Lake are the only known locations in Utah (USDA Forest Service 1990, Welsh and others 1987, p. 535). This is a plant of boggy situations at much higher latitudes, also found in a few other, widely scattered locations in the Rocky Mountains.

Other than the Potentilla, no plant species considered "sensitive" by the occur on the master species list, which was cross-checked with the Regional Forester's Approved Sensitive Species List (USDA Forest Service 1989, pp. 30-40).

Seven broadly-defined types of habitat have been delineated in the SPPRNA. Many of them are discussed by Jensen and Tuhy (1982). The sole forest habitat type is described at length by Mauk and Henderson (1984, pp. 44-45).

The following descriptions are of distinct units. The situation on the ground is not quite so clear-cut, however. Considerable intergradation occurs among the six non-forested "types".

1. Ponds.

These are open bodies of water that support aquatic plant species such as Nuphar polysepalum, Potamogeton spp., and Sparganium minimum. In addition, Carex rostrata grows in water up to 1.5 feet (45 cm) deep around the margins of some ponds.

The largest pond in the natural area, termed "Big Pond" (Photo 2), is about 3 acres (1.2 ha) in size. Map 4 shows its location in the southeastern part of the SPPRNA. The remainder of the large potholes, concentrated in the eastern half of the tract, support

Table 4. Plant species in the proposed Sims Peak Potholes Research Natural Area. Those marked with an asterisk (*) were collected in 1983 and deposited in herbaria at Utah State University and Brigham Young University. The authority for trees is Little (1979); for shrubs, graminoids and forbs it is Welsh and others (1987).

Trees	
Abies lasiocarpa	subalpine fir
Picea engelmanii	Engelmann spruce
Pinus contorta	lodgepole pine
Shrubs	
Berberis repens	Oregon grape
Chrysothamnus nauseosus	rubber rabbitbrush
Chrysothamnus viscidiflorus	Douglas rabbitbrush
Juniperus communis	common juniper
Lonicera involucrata	black twinberry
Pachistima myrsinites	mountain lover
Potentilla fruticosa	shrubby cinquefoil
Prunus virginiana	chokecherry
Rosa nutkana	Nootka rose
Rubus idaeus	raspberry
Salix planifolia	plainleaf willow
Sambucus racemosa	red elderberry
Shepherdia canadensis	soapberry
Symphoricarpos oreophilus	mountain snowberry
Vaccinium myrtillus	dwarf billberry
Vaccinium scoparium	grouseberry
Graminoids	
Elymus sp.	wheatgrass
*Agrostis humilis**	alpine bentgrass
Agrostis idahoensis	Idaho bentgrass
*Agrostis scabra**	ticklegrass
*Alopecurus alpinus**	alpine foxtail
Bromus ciliatus	fringed brome
*Calamagrostis canadensis**	bluejoint reedgrass
*Carex aquatilis**	water sedge
*Carex atrata**	blackened sedge
*Carex aurea**	golden sedge
Carex bella	beautiful sedge
*Carex canescens**	pale sedge
*Carex illota**	sheep sedge

(continued)

(Table 4, continued)

Carex lasiocarpa*	slender sedge
Carex limosa*	mud sedge
Carex microptera*	small-wing sedge
Carex muricata*	
Carex occidentalis*	western sedge
Carex rossii*	Ross sedge
Carex rostrata	beaded sedge
Carex saxatilis*	russet sedge
Carex vesicaria*	blister sedge
Danthonia californica	California oatgrass
Danthonia intermedia*	timber oatgrass
Deschampsia cespitosa*	tufted hairgrass
Eleocharis palustris*	creeping spikerush
Eleocharis pauciflora*	
Elymus glaucus	blue wildrye
Eriophorum polystachion*	tall cottongrass
Juncus articulatus	jointed rush
Juncus arcticus*	wiregrass
Juncus confusus	
Juncus drummondii*	
Juncus ensifolius	swordleaf rush
Juncus hallii	Halls rush
Juncus mertensianus*	Mertens rush
Juncus nevadensis*	Nevada rush
Luzula campestris*	hairy woodrush
Luzula parviflora*	millet woodrush
Muhlenbergia filiformis	pullup muhly
Phleum alpinum*	alpine timothy
Poa leptocoma*	bog bluegrass
Poa nervosa	Wheelers bluegrass
Poa pratensis	Kentucky bluegrass
Trisetum spicatum*	spike trisetum
Trisetum wolfii*	Wolfs trisetum

Forbs

Achillea millefolium	milfoil yarrow
Agoseris glauca	pale agoseris
Allium brevistylum	
Antennaria corymbosa	plains pussytoes
Antennaria parvifolia	common pussytoes
Arenaria congesta*	head sandwort
Arenaria laterifolia	bluntleaf sandwort
Arnica cordifolia	heartleaf arnica

(continued)

(Table 4, continued)

Aster glaucodes	blueleaf aster
Aster occidentalis*	western aster
Caltha leptosepala*	marsh-marigold
Campanula rotundifolia	bluebells of Scotland
Castilleja linariaefolia	narrowleaf paintbrush
Castilleja miniata*	scarlet paintbrush
Cirsium sp.	thistle
Collinsia parviflora	blue-eyed Mary
Descurainia pinnata	pinnate tansymustard
Draba rectifructa	mountain draba
Draba stenoloba	Alaska draba
Epilobium angustifolium	fireweed
Epilobium saximontanum	Rocky Mountain willowherb
Equisetum arvense	meadow horsetail
Erigeron flagellaris*	trailing daisy
Erigeron peregrinus*	strange daisy
Erigeron ursinus*	bear daisy
Eriogonum umbellatum	sulfur buckwheat
Fragaria virginiana	strawberry
Galium boreale*	northern bedstraw
Galium trifidum*	small bedstraw
Gayophytum racemosum	
Gentiana calycosa*	explorer gentian
Gentianella amarella*	northern gentian
Geranium richardsonii*	Richardson geranium
Habenaria hyperborea	northern bog-orchid
Habenaria unalascensis*	Alaska bog-orchid
Viguiera multiflora	showy goldeneye
Hieracium albiflorum*	white hawkweed
Hieracium gracile	slender hawkweed
Liguisticum tenuifolium	slender-leaf liguisticum
Lupinus sp.	lupine
Lychnis drummondii	Drummond catchfly
Machaeranthera sp.	aster
Madia glomerata	tarweed
Menyanthes trifoliata*	buckbean
Mertensia ciliata	mountain bluebells
Nuphar polysepalum	yellow pondlilly
Orthocarpus luteus	yellow owl-clover
Osmorhiza depauperata	blunt-fruit sweet-cicely
Pedicularis bracteosa	
Pedicularis groenlandica*	elephant head
Pedicularis parryi	Parry lousewort
Pedicularis racemosa	leafy lousewort

(continued)

(Table 4, continued)

Penstemon procerus	small-flowered penstemon
Penstemon whippleanus	Whipple penstemon
Polygonum bistortoides*	American bistort
Polygonum kelloggii	Kelloggs knotweed
Polygonum viviparum*	alpine bistort
Potamogeton alpinus*	northern pondweed
Potamogeton natans*	floating pondweed
Potentilla diversifolia	wedge-leaf cinquefoil
Potentilla palustris*	marsh cinquefoil
Pyrola secunda	secund wintergreen
Pyrola virens*	greenish wintergreen
Rorippa curvipes	
Sedum lanceolatum	common stonecrop
Sedum rhodanthum*	pink stonecrop
Senecio integerrimus*	gauge plant
Senecio sphaerocephalus*	roundhead groundsel
Sibbaldia procumbens	sibbaldia
Solidago multiradiata	low goldenrod
Solidago spathulata	coast goldenrod
Sparganium minimum*	narrowleaf burreed
Spiranthes romanzoffiana*	hooded ladies tresses
Stellaria longipes*	long-stalked starwort
Taraxacum officinale	common dandelion
Utricularia minor*	lesser bladderwort
Verbascum thapsus	woolly mullein
Veronica serpyllifolia*	thyme-leaf speedwell
Veronica wormskjoldii*	Wormskjold speedwell
Vicia americana	American vetch
Viola sp.	violet
Zigadenus elegans	elegant death camas

marshy swards dominated by Carex spp. However, some of these larger potholes contain small central ponds that are being slowly invaded by vegetation (Photo 5). Two such ponds were found to be over 5 feet (1.5 m) deep, though their water surface area was less than 50 m^2 (0.012 ac).

Numerous small pools are scattered within the forest in thw estern part of the RNA. Their dark appearance and abruptly-sloping banks earned them the informal term "inkwells". The majority of these are too small to detect on aerial photographs, and thus not all appear on Map 4.

2. Marshes.

The term "marsh" as used in this Record signifies an herbaceous (generally Carex) community growing in water. Water depth varies from 1.5 feet (45 cm) to essentially zero; in the latter case the water table is very near the surface and a person will sink in enough to get wet feet.

a) The wettest marsh sites are characterized by pure stands of tall, rank Carex rostrata. These often occupy the centers of potholes where water is up to 1.5 feet (45 cm) deep (Photo 3). This same species is dominant, though not the sole constituent, in centers of potholes where water is shallower (Photo 8).

b) Carex aquatilis communities occur in places with shallow or no standing water. Not many marshy sites were seen where this species was pure or dominant. The few such instances observed were in locations surrounding Carex rostrata swards.

c) Several nearly-pure stands of Carex lasiocarpa were noted in sites with shallow or no standing water (Photo 4). In such marshy situations this Carex averages about 2 feet (60 cm) tall.

d) One nearly-pure community of Carex saxatilis was seen in the southeastern corner of the tract. This species is more often a subordinate constituent of mixed Carex communities.

e) Except for (a) above, pure communities of sedges are relatively uncommon in the SPPRNA. Marshy habitats usually contain various mixtures of Carex species; the five most common here are C. aquatilis, C. canescens, C. lasiocarpa, C. rostrata, and C. saxatilis.

The water level in the marshes fluctuates seasonally, and perhaps from year to year as well. Many of them contain small hummocks supporting species less tolerant of waterlogging, such as Salix phylicifolia and Calamagrostis canadensis.

The factors influencing the presence and dominance of these Carex species are incompletely understood. Briggs (1978) and Briggs and MacMahon (1983) discussed the largely interrelated factors of water level, redox potential, and soil aeration with respect to community composition. Initial establishment may be an important factor, also. The vigorous rhizomatous habit of these sedges makes it difficult for "invading" species to change the composition of the native stands.

3. Bogs.

In this context, "bog" signifies an organic mat that floats on top of water, as opposed to a marsh where plants are rooted beneath and grow up through water. Bogs characteristically quake or "jiggle" when walked on; over some the organic mat is so thin that one has a feeling of walking on jello.

In the SPPRNA, bogs usually occupy positions near the centers of potholes. Bogs were noted to have two aspects:

a) Floating mats adjacent to open water. Several small ponds in the RNA are being encroached upon by such organic mats (see Photo 5). However, not all ponds are fringed by such boggy habitats.

b) Organic mats that have sealed over a central pond, and have formed a "skin" on top of the water.

Most boggy habitats in the RNA have a very distinct flora. Common species include Carex limosa, Menyanthes trifoliata, Sphagnum (moss) spp., Carex aquatilis, Carex canescens and Pedicularis groenlandica (Photo 6). The first three taxa are essentially restricted to bogs, whereas the others are more widespread. Also, Potentilla palustris is restricted to boggy habitats (see Photo 6), though not all contain it.

A second, less common type of bog community is dominated by Carex lasiocarpa. This sedge averages about 1 foot (30 cm) tall, about half the height the same species reaches in marshy habitats.

4. Wet meadows.

"Wet meadows" in this Record refers to fairly distinct plant associations occupying sites within a certain soil moisture range.

In the SPPRNA, typical wet meadows are most often dominated by Calamagrostis canadensis. Carex aquatilis is abundant where water tables are higher than average. Deschampsia cespitosa becomes more abundant in locations somewhat drier than the norm. In general, water tables are far enough below the surface during mid- to late summer that a person can walk through without getting wet feet.

Wet meadows most often surround marshy habitats that occupy pothole centers (see Photo 8). In such positions, the meadowy habitat may have a gentle (almost imperceptible) slope relative to the level marsh. One Calamagrostis-dominated community was observed in a gently-sloping, linear corridor within the forest.

5. Mesic meadows.

These are the driest herbaceous communities of the SPPRNA. Plant species composition is generally rich, though somewhat variable from place to place. Deschampsia cespitosa is common, and Danthonia intermedia may be locally abundant. One community inventoried in 1983 contained these two plus an additional fifteen graminoid and seventeen forb species.

Mesic meadows are not common in the RNA. Those present occurred in gently-sloping, linear corridors which connect level, wetter potholes (Photo 7).

6. Forest margins.

This habitat is transitional between potholes and forests. Most potholes are fringed by these communities, which continue a short ways onto the adjacent forested toeslope. However, the "inkwells" in the western part of the natural area do not exhibit such well-developed transitional margins.

Species composition is similar to that of wet and/or mesic meadows. Common species include Calamagrostis canadensis, Erigeron peregrinus, Juncus drummondii and Salix phylicifolia. The presence of Vaccinium scoparium underscores the transitional nature of these communities.

7. Abies lasiocarpa/Vaccinium scoparium (subalpine fir/grouseberry) habitat type (ABLA/VASC).

The forests of the SPPRNA all appear to be growing on this habitat type, one of the commonest in the Uintas (Mauk and Henderson 1984). Subalpine fir and Engelmann spruce are present and reproducing, but lodgepole pine is the dominant overstory species (Photo 9). The understory features a patchy to continuous

carpet of Vaccinum scoparium averaging 4 inches (10 cm) tall. Common associated species include Arnica cordifolia, Carex rossii, Hieracium spp., and Poa nervosa. Based on scarcity or absence of Arnica latifolia and Carex geyeri, these forest communities appear to characterize the Vaccinium scoparium phase of ABLA/VASC.

Only this forest habitat type is present, but the stands thereon exhibit a variety of stocking conditions and species mixtures. The most common condition is one of sapling- to pole-sized (<10 inches (25 cm) dbh) lodgepole pine. Such stands generally lack spruce and fir, and may be quite dense.

Through the central part of the SPPRNA the visual impression is one of irregularity. A lack of clear patterning or structure is evidenced by heavily-clumped stands alternating with thinly-stocked ones. No obvious environmental factor accounts for this. The eastern and western ends of the RNA support the most mature stands. There, all three conifer species are reproducing; occasional Engelmann spruce up to 28 inches (70 cm) dbh codominate with lodgepole pine. The westerly stands are not far from the main Red Cloud Loop road, and are fairly similar to forests that have been logged in the vicinity.

No timber inventories have been performed in the RNA, whether by the Forest Service or by RNA investigators. The following mensurational data reported by Mauk and Henderson (1984) would probably apply here, assuming the SPPRNA's forests are modal for the VASC phase of ABLA/VASC.

1. Mean basal area for all species is 159+16 ft^2/ac (36.5+ 3.7 m^2/ha).

2. Mean 50-year site index for lodgepole pine is 35+4; for Engelmann spruce it is 35+14.

3. Estimated average yield capability is 37 ft^3/ac/yr (range of 20 to 61), which converts to 2.6 m^3/ha/yr (range of 1.4 to 4.3).

Fauna

Field inventories did not include purposeful observations of mammals, reptiles, or amphibians. A number of lists indicate which species in these groups potentially dwell in the SPPRNA. For example, Svihla (1932) discusses mammal distributions with respect to habitat on the north slope of the Uinta Mountains. Austin and Urness (1977) report relative abundances of small mammals in lodgepole pine forests, in an area about 10 miles (16 km) northeast

of the RNA. The Ashley National Forest Analysis of Management Situation (AMS) lists known or potential animal occurrences by ranger district and habitat (USDA Forest Service 1982). For the sake of brevity, such lists are not reproduced here.

Inventories for this Record did, however, include observations of birds. Although it is not the result of a formal census, the list shown on Table 5 generally indicates which species are present in the RNA. Austin and Perry (1979) found a similar (but richer) bird species composition in a lodgepole pine/meadow complex 10 miles (16 km) northeast of the RNA.

Table 5. Bird species seen or heard in and near the Sims Peak Potholes Research Natural Area. Scientific nomenclature follows Utah Division of Wildlife Resources (1990).

Common Name (Scientific Name)	Where Seen or Heard
Northern Flicker (Colaptes auratus)	Forests only
Hairy Woodpecker (Picoides villosus)	Forests only
Gray Jay (Perisoreus canadensis capitalis)	Forests only
Mountain Chickadee (Parus gambeli)	Forests only
Red-breasted Nuthatch (Sitta canadensis)	Forests only
Brown Creeper (Certhia americana)	Forests only
American Robin (Turdas migratorius propinquus)	Forests only
Hermit Thrush (Catharus guttatus)	Forests only
Yellow-Rumped Warbler (Dendroica coronata)	Forests only
Townsend's Warbler (Dendroica townsendii)	Forests only
Wilson's Warbler (Wilsonia pusilla)	Forests only
American Goldfinch (Carduelis tristas pallidus)	Forests only
Dark-eyed Junco (Junco hyemalis)	Forests/marshes
Song Sparrow (Melospiza melodia)	Marshes/meadows

No animals officially listed as threatened or endangered are known to occur within the SPPRNA. The Ashley AMS identifies sensitive species on the Forest. Two such species may be present here: the Canada lynx (Lynx canadensis canadensis) and the northern flying squirrel (Glaucomys sabrinus lucifugus).

The AMS also identifies eleven Management Indicator Species for the Forest (by common name only). Table 6 lists these along with the likelihood of their presence in the SPPRNA.

Table 6. Ashley National Forest Management Indicator Species (MIS) in relation to the Sims Peak Potholes Research Natural Area (SPPRNA).

MIS	Present in SPPRNA?
Elk	Yes -- summer range
Mule deer	Yes -- summer range
Goshawk	Probably
Golden Eagle	Doubtful
Sage Grouse	No
White-tailed Ptarmigan	No
Yellow-bellied Sapsucker	No
Warbling Vireo	No
Lincoln's Sparrow	Possibly
Song Sparrow	Yes (in wetlands)
Cutthroat Trout	Very unlikely

Land Systems Inventory (LSI) information for the Vernal Ranger District confirms that these forest/pothole complexes are important deer and elk habitat during late spring, summer, and fall. The Flaming Gorge District LSI notes that moose may wander through them as well. These ungulates are attracted to these locations because they provide abundant forage, water, escape cover, and seclusion from humans.

Collins and others (1978) studied diet and activities of tame elk in a similar area about 10 miles (16 km) northeast of the proposed RNA. They found that elk preferred wet and dry meadows as grazing sites. Vaccinium scoparium browse was of limited importance in elk diets, though mushrooms growing on on the forest floor were eaten regularly. Wet meadows and mature (non-stagnated) lodgepole pine forests were preferred for resting and other non-grazing activities. Ashley NF officials surmise that elk wallows exist within the natural area. However, none were seen during inspections in 1982 and 1983.

Aquatic Fauna

The Sims Peak Potholes are located in the Uinta Mountains which contain a heavy concentration of aquatic organisms, especially insects, which do not occur anywhere else in Utah (Merritt and Cummins 1978).

Musser (1962) lists several dragonfly species that occur only as relicts in the Uinta Mountains. Three of these species, Aeshna eremita, Cordulia shurtleffi and Leucorrhinia hudsonica, were collected during the August 22 and 23, 1983 field excursion to the Sims Peak Potholes. Provonsha (1975) indicates that two damselfly species, Lestes dryas and Ischnura cervula, also have limited distribution patterns.

Caddisfly adults are relatively good flyers but their aquatic larvae are often restricted to narrow habitat conditions. Of the two hundred caddisfly species listed in Baumann and Unzicker (1981) approximately twenty species have been recorded in Utah only from the Uinta Mountains. Five of these rare species have been found to occur in the Sims Peak Potholes area: Hesperophylax sp. A, Lenarchus brevipennis, Limnephilus externus, Limnephilus n. sp. A, and Limnephilus n. sp. B.

The Sims Peak Potholes wetland ecosystem can be divided into four types of habitat based on amount of moisture: pond, marsh, bog and wet meadow. The localities that contain a combination of these habitat types, such as Flamingo Marsh (informal name given during field inventory), should have the greatest amount of species diversity (Usinger 1963).

This same set of factors serves to explain why the proposed SPPRNA is so rich in aquatic invertebrate species. A wide variety of habitat types occurs in a very concentrated geographical area. These factors are additionally enhanced because the varied habitat types can occur in different combinations in very close proximity. The result is a concentration of specialized aquatic insects in a very small geographical area.

Aquatic vertebrate species are limited but the western chorus frog, Pseudacris triseriata is common in the proposed SPPRNA as would be expected according to Stebbins (1976).

In summary, the proposed SPPRNA simply concentrates the aquatic habitat types of the Uinta Mountains into a small, specialized area. This is one of the few places of its kind in the entire mountain range, especially in such a small geographical area.

If the Sims Peak Potholes are conserved then the majority of the rare and specialized aquatic insect species that occur in the Uinta Mountains will be preserved. This can occur without adversely affecting either timber or recreation interests, because the area is so wet and unevenly contoured.

Table 7 identifies the specific locations and habitats in which aquatic fauna were collected in 1983. The location names were given during the course of the inventories, and with the exception of Big Pond do not appear

on any maps. Table 7 lists the aquatic fauna collected in the six locations identified in Table 8.

Table 7. Aquatic fauna localities sampled and habitat type.

1.	Flamingo Marsh	pond and marsh
2.	Battleship Bog	marsh and bog
3.	Leg of Lamb Pond	pond
4.	Big Pond	pond
5.	Black Pond	pond
6.	Pencil Meadow	wet meadow

Geology and Hydrology

Precambrian rocks of the Uinta Mountain Group form the core of this range, including the vicinity of Sims Peak. These rocks are predominantly dark-red to buff, medium- to coarse-grained quartzite and quartzitic sandstone (Untermann and Untermann 1964). They accumulated as marine and freshwater sediments in the ancient Uinta trough. Deposition began as long as one billion years ago and continued until gentle uplift ushered in the Paleozoic Era some 550-600 million years ago. Altogether about 24000 feet (7300 m) of sediments accumulated (Hansen 1969).

Episodes of deposition, erosion and deformation continued through the Paleozoic and Mesozoic Eras. Periods of major uplift in late Cretaceous, late Eocene and Pliocene times elevated the strata and formed the present Uinta Mountains (Untermann and Untermann 1964).

Pleistocene glaciers greatly modified these mountains. Several glacial stages have been recognized. The most recent valley glaciers were associated with the Pinedale Glaciation (Richmond 1965), which ended about 10000 years ago. It was during this stage that a glacier formed between Marsh and Leidy Peaks and descended the South Fork of Ashley Creek (Atwood 1909). A lateral moraine left by this glacier comprises the present-day proposed SPPRNA. The glacial till of this tract is thus derived wholly from the quartzite of the Uinta Mountain Group. Later glaciers, some as recent as 900 years ago, were confined to cirques and did not affect the valleys below.

The pothole-dotted lateral moraine, occupied by the natural area, lies above glacial-alluvial valleys to the north and south. Its elevated position and porous substrate seem to have retarded the development of an integrated drainage system. At least there is no surface drainage, save for a few channels which flow only during peak snowmelt.

Dispersed subsurface drainage probably occurs within the glacial till. This conjecture is based on a number of observations made during the field

Table 8. Aquatic fauna collected at Sims Peak Potholes, 23 August 1983.[1,2]

Order, Family, Genus, Species (common name)	1	2	3	4	5	6
Odonata (dragonflies and damselflies)						
Aeshnidae						
Aeshna eremita				x		
Aeshna palmata	x					
Libellulidae						
Cordulia shurtleffi	x			x		
Leucorrhinia hudsonica	x		x	x		
Coenagrionidae						
Lestes dryas	x			x		
Ischnura cervula	x			x	x	
Hemiptera (true bugs)						
Corixidae (water boatmen)						
Sigara alternata	x	x		x		
Callicorixa audeni	x	x				
Gerridae (water striders)						
Gerrus notabilis	x			x		
Gerrus gillettei	x	x		x		
Gerrus buenoi	x					
Notonectidae (back swimmers)						
Notonecta sp.	x			x		
Coleoptera (beetles)						
Dytiscidae (predaceous water beetles)						
Acilius semisulcatus abbreviatus	x		x			
Agabus sp.		x		x		
Colymbetes sculptilis		x	x			
Hygrotus impressopunctatus	x	x				
Hydroporus pervicinus		x				
Rhantus wallisi			x		x	
Gyrinidae (whirligig beetles)						
Gyrinus punctellus	x					
Gyrinus minutus	x					
Haliplidae (crawling water beetles)						
Haliplus sp.				x		
Hydrophilidae (water scavenger beetles)						
sp. A	x	x				

Table 8. (Continued). Aquatic fauna collected at Sims Peak Potholes, 23 August 1983.[1,2]

Order, Family, Genus, Species (common name)	1	2	3	4	5	6
Trichoptera (caddisflies)						
Limnephilidae						
Hesperophylax sp. A	x					
Lenarchus brevipennis	x	x		x		
Limnephilus externus	x	x		x		
Limnephilus sp. A	x	x		x		x
Limnephilus sp. B	x					
Phryganeidae						
Agrypnia deflata			x	x	x	
Diptera (true flies)						
Chaoboridae (phantom midges)				x	x	
Chironomidae (true midges)	x	x	x	x	x	
Culicidae (mosquitoes)				x		
Syrphidae (flower flies)		x			x	
Tipulidae (crane flies)					x	
Amphipoda (scuds)						
Hyallela azteca				x		
Procoela						
Hylidae (tree frogs)						
Pseudacris triseriata (chorus frog)						

1. All specimens deposited at the Monte L. Bean Life Science Museum, Brigham Young University, Provo, Utah.
2. Locality numbers refer to those listed in Table 7.

inventory. First, ponds and marshes do not appear to be stagnant, even though most are slowly being filled in by vegetation. The lateral moraine slopes as a unit gently toward the east-northeast. Subsurface water flowing along this gradient may keep the surface wetlands "flushed out".

Second, some long-term (versus seasonal) fluctuations in water level are evident. Big Pond is fringed by dead lodgepole pine (Photo 2), suggesting that the water surface was formerly stable at a lower level. Such a rise in water level may have resulted from shifts in subsurface flow patterns.

Overall this tract has a high water table which would be susceptible to pollution should timber harvest or other development occur. The area is a high water producer, though most of the water is delivered to streams as groundwater.

Soils

The Vernal District Land Systems Inventory identifies the entire proposed SPPRNA as landtype "AM1". This type is described as "hummocky lateral moraines with numerous small potholes positioned above the valley bottoms with no integrated drainage system".

Mineral soils within this setting are ultimately derived from Precambrian quartzite parent material, which was worked into till by glacial action. Forested habitats are characterized by soils formed directly in the reddish brown till on rolling slopes with low relief. These soils are deep, cobbly or stony loams which in many places are covered by organic duff. They are generally well-drained, especially on convex surfaces.

A representative profile has a discontinuous very dark grey cobbly sandy loam surface horizon, up to one inch (2.5 cm) thick. This is subtended by pinkish grey cobbly loamy fine sand or fine sand about 25 inches (64 cm) thick. Underlying this are reddish brown cobbly loamy fine sands and cobbly fine sandy loams. Reaction is strongly to very strongly acid. Coarse fragment content ranges from 5 to 35 percent, comprised mostly of semi-angular cobbles and stones.

Two other soils occur in non-forested habitats. Soils of mesic and wet meadows are primarily loams and clay loams. These are deep and are poorly drained to ponded during wetter parts of the year.

A typical profile has a black to very dark grey clay or clay loam surface horizon about 12 inches (30 cm) thick. An underlying horizon 32 inches (81 cm) thick has two parts. The upper is a mottled firm grey clay, while the lower is a mottled firm reddish clay loam. Underlying this is a mottled reddish brown cobbly loam. Reaction is strongly acid near the surface, becoming medium acid with depth. Coarse fragment content is less than 10 percent in the solum. This content increases to 10 to 35 percent, primarily cobbles and stones, in subtending strata.

Soils of marshy and boggy habitats are almost totally comprised of well-decomposed organic material. In some places this organic layer is well over 50 inches (127 cm) thick. Where it is thinner, it is subtended by loamy material, by sand, or by cobbly sand. Water tables are seasonally high; many marshes are inundated year-round.

Lands

The entire area proposed as the Sims Peak Potholes Research Natural Area is made up of reserved National Forest System land, and is surrounded by such land. There were no encumbrances or outstanding rights against these lands. No private inholdings or portions of State-owned sections occur within the proposed boundary.

The Ashley National Forest's Land and Resource Management Plan included the candidate SPPRNA in Management Area "a". Pending classification through this Record, the lands within the proposed boundaries will be under a "custodial management prescription (a) which precludes timber harvest, road construction, or any other development activities" (USDA Forest Service 1986, p. IV-73).

Cultural Values

No sites of historical, cultural, or archeological significance are known to exist in the SPPRNA (USDA Forest Service 1982). Field inventories corroborated this, detecting no man-made structures or cultural remains whatsoever.

IMPACTS AND POSSIBLE CONFLICTS

Mineral Resources

Literature concerning the economic geology of this general region mentions no resources associated with the Precambrian quartzite of the Uinta Mountain Group (Pruitt 1961, Untermann and Untermann 1964, USDA Forest Service 1982). Bureau of Land Management (BLM) microfiche dated January 19, 1990 show no mining claims in the land sections partly within the Sims Peak Potholes RNA's proposed boundaries.

The entire tract currently lacks oil and gas leases (Table 9). The applicable documentation, from BLM plats dated November 3, 1988 and December 21, 1989 is as follows:

Table 9
Oil and Gas Leasing Status in the Proposed
Sims Peak Potholes Research Natural Area (March 1990)

Sections(s)	Lease Number	Lease Holder
13 (T. 1S R. 19E)	N/A	None
24 (T. 1S R. 19E)	N/A	None
17 & 18 (T. 1S R. 20E)	U50780	Terminated 11/1/85
19 & 20 (T. 1S R. 20E)	N/A	None

Oil and gas leases are widespread where allowed on federal land in Utah. If they are later issued for the lands involved here, it does not necessarily indicate that economic reserves lie beneath. Based on the historically low interest and the geology of the Sims Peak vicinity, the potential for mineral or oil/gas development seems very low, and it should not bar or encumber RNA designation.

Grazing and Fences

The SPPRNA lies within the Black Canyon cattle and horse (C&H) allotment. From 1931 to 1971 this had been a sheep allotment. During that time sheep grazed only on the borders of the natural area, and were not herded through the interior among the potholes. The allotment was converted to cattle in 1972.

Analyses for the allotment identified three range types in the area now encompassed by the proposed boundary. Twenty percent (20%) of the area is classified as of secondary suitability (S2w) for cattle. Dry weight forage production is appreciable; about 1050 lb/ac (1177 kg/ha). Thirty percent (30%) of the area is unsuitable (N6) coniferous timber, averaging about 45 lb/ac (50 kg/ha). The remaining fifty percent (50%) is classified as heavy timber (7t), with negligible forage production.

The allotment is currently managed under a rest-rotation grazing system. The unit containing the SPPRNA is rested one year out of four. When this unit is to be grazed, cattle are moved in from lower units to the south. The stock are not purposely pushed into the potholes country, where controlling them is very difficult. A few strays occasionally do wander within the SPPRNA's boundaries. Some dung was seen on the timbered ridges in 1983, but it appears to be below the amount that would be associated with historically transient, very light grazing. This can be permissible in an RNA if fencing is quite difficult and expensive.

The cattle (no actual cows were ever seen) had appeared to confine themselves to the woods; neither manure nor grazed vegetation were seen in meadows or marshes. It is unlikely that this infrequent, relatively recent cattle presence has altered the SPPRNA from the pristine condition all other evidence points to.

The SPPRNA is not well suited or accessible to cattle, due to the dense timber and the scattered and very wet nature of the forage-producing areas. In addition, grazing appears to be of no value in maintaining specific vegetation communities. Research Natural Area establishment will not require a reduction in stock numbers or length of season. Ashley NF officials indicated that whatever livestock entries do occur are infrequent. The Vernal District's range conservationist should check the RNA twice yearly and notify the District Ranger if use increases or becomes abusive.

No drift or permanent fences exist along the proposed boundary. The Vernal Ranger District does not intend to construct any, whether for general allotment management or to protect the RNA from cattle. Fencing the entire boundary or appreciable stretches of it would be very expensive, and maintenance needs would be high because of the wet ground and timber blowdown. Moreover, there appear to be no "chokepoints" at which short sections of fence would keep out nearly all the strays, because it is not known where they enter.

In light of the foregoing factors (discussed with the Ashley NF in March 1990 following a perusal of Washington Office comments dated September 11, 1985) it appears justifiable to proceed with establishment. A subsequent management plan might identify the opportunity for short, strategic cattle fences, but they are not an essential prelude to establishment.

Timber

Small clearcuts have taken place immediately to the south, west, and north of the SPPRNA's proposed boundary. Neither falling and bucking, roadbuilding, or yarding have impinged on it. This is also true of personal and commercial fuelwood cutting.

About 400 acres (160 ha) of the timber within the RNA is of commercial quality and quantity, but access is a severe operability constraint. The scattered potholes separate the few ridges of mature timber. In addition, there would be risks of excessive soil disturbance and sedimentation of the high water table. Thus, the Ashley NF has no plans for silvicultural activities here, nor is it needed for haul-road rights-of-way. Research Natural Area status will not reduce the Forest's suitable timberland base (USDA Forest Service 1986, p. II-11). The RNA is outside the Hicks Park timber sale project area, and will be buffered from cutting units to the north (USDA Forest Service 1990).

Watershed Values

Research Natural Area designation should have no adverse impact on the quantity or quality of water produced here or moving through the tract from higher ground. To the contrary, an RNA would protect a fairly sensitive and easily-polluted groundwater system within this moraine.

Recreation Values

The greatest use of the SPPRNA probably occurs during elk and forest-grouse hunting seasons. The fishing potential in Big Pond is unknown, but some signs of visitation were seen along its shore.

On the whole the RNA seems unknown to the general recreating public. No backcountry or "hunter" camps, fire rings, or evidence of repeat visitation were seen, and just a few pieces of trash were encountered. The integrity of the RNA should remain unaffected by recreational activity, for two major reasons: (1) use shows no signs of increasing or becoming abusive; and (2) the Ashley National Forest has no plans for developing campgrounds, trails, overlooks, or other facilities to draw and support visitation.

Wildlife and Plant Values

Designation should have no impact on wildlife values in the proposed RNA. The tract would continue to provide an undeveloped refuge (subject, of course, to light hunting) for elk, deer, perhaps moose, and a host of other mammal, amphibian, invertebrate, and avian species. Opportunities for more detailed censuses and studies than reported here would be unimpaired and if anything, enhanced, by establishment (Appendix E).

The SPPRNA has no known threatened, endangered, or sensitive plant species growing within its boundaries. Thus, the Endangered Species Act has no bearing on establishment. However, the inherent values of the RNA for floral study and conservation are exceptionally high, for several well-documented reasons. These include the variety of species in the Cyperaceae and Juncaceae in particular, a new record for Potentilla palustris in Utah, and distinct richness (Table 4). Establishment is a highly appropriate means of recognizing and maintaining these and other botanical values.

Special Management Area Values

The Sims Peak Potholes candidate RNA is not encompassed by any larger special management areas, such as classified Wilderness.

It lies well to the east of the High Uintas Wilderness, and has never been included within any proposed expansion of the Wilderness. The alternative of a Special Interest Area (FSM 2360) for the potholes country has never been proposed, nor was it considered during formulation of the Forest Plan. Research Natural Area establishment correspondingly has no relationship to other special management area values.

Transportation Plans

Forest Roads #018 and #036 lie close to the western and southern boundaries, respectively (Maps 2 and 3). No roads or trails enter the area, however. Research Natural Area designation should have no impact on existing or contemplated transportation systems, including access alternatives for the Hicks Park timber sales (USDA Forest Service 1990). The Ashley NF has no intention of extending roads or trails into the proposed RNA, which would pose a formidable challenge to construction and maintenance.

MANAGEMENT PRESCRIPTION

The Ashley National Forest Plan specifies both the interim management and the post-establishment management of the SPPRNA. In essence, standards and guidelines applying to the Vernal Ranger District also apply here, with these modifications (USDA Forest Service 1986, p. IV-73):

> Management Area a (ME1-MI1) - this Management Area occurs as a single unit in the vicinity of the Sims Peak Pothole area. This area is inventoried as a candidate Research Natural Area. The establishment [record] for the RNA [is being] prepared and will be processed through proper channels. If the RNA is administratively classified, an RNA management plan will be developed to cover management. If the RNA is not classified, it will be managed under the same standards and guidelines as the surrounding area. Until the classification decision is made, management will be under a custodial management prescription (a) which precludes timber harvest, road construction, or any other development activities.

Refer to Appendix B, pages IV-5 and IV-6 for a display of prescriptions applying to all Ashley National Forest Research Natural Area candidates, including this one.

The management plan called for if establishment occurs would address minimization of livestock entry without fences, the relationship of timber-sale activity on the north to RNA

boundary integrity, and precautions to control researcher impacts. The Nature Conservancy has indicated its interest in writing the plan through a cost-share agreement with the Intermountain Research Station or the Ashley NF, perhaps in FY92 or -93 after establishment becomes final.

No special protection measures are forseen as being needed to control any light recreational use (including transient packstock travel). Signing and other interpretive measures for casual visitors and passerby are probably superfluous, or could be done elsewhere where potholes are concentrated.

ADMINISTRATION RECORDS AND PROTECTION

Administration and protection of the Sims Peak Potholes Research Natural Area will be the responsibility of the Ashley National Forest. The District Ranger, Vernal Ranger District, has direct responsibility. No major efforts are anticipated, hence funding and staff time required will be minor.

The Director of the Intermountain Research Station will be responsible for any studies or research conducted in the area. He will evaluate research proposals and coordinate all studies and research in the SPPRNA with the District Ranger. All plant and animal specimens collected in the course of research conducted in the area will be properly preserved and maintained within the Intermountain Herbarium (Utah State University), the herbarium of Brigham Young University (BYU), or (faunal and entomological specimens) the Monte L. Bean Life Science Museum of BYU.

Records for the Sims Peak Potholes RNA will be maintained in the following offices:

Regional Forester, Ogden, Utah
Forest Supervisor, Ashley National Forest, Vernal, Utah
District Ranger, Vernal Ranger District, Vernal, Utah
Director, Intermountain Research Station, Ogden, Utah
Intermountain Research Station, Provo, Utah

ARCHIVING

The Provo office of the Intermountain Research Station will be responsible for maintaining the Sims Peak Potholes RNA research data file, reports, and lists of plant and other samples collected and deposited in herbaria and museums.

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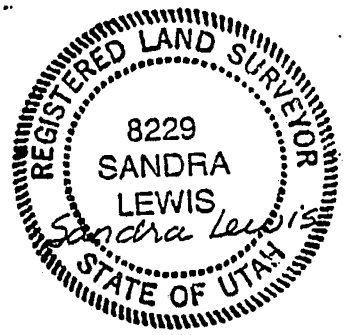
I certify the enclosed boundary description of the Sims Peak Potholes Research Natural Area was prepared under my direct supervision.



Sandra Lewis — Forest Land Surveyor

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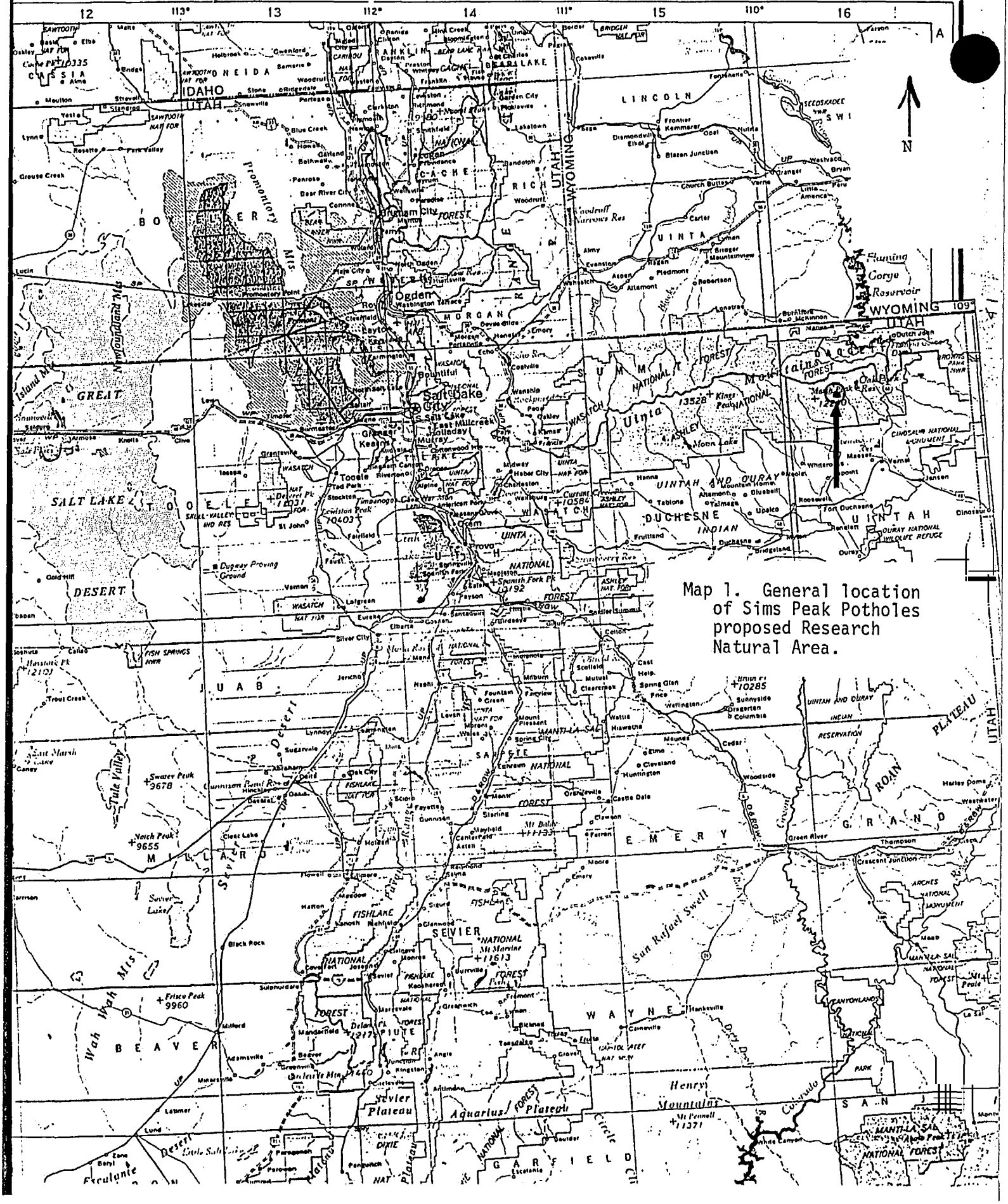
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Sevier Plateau
Aquarius Plateau
Henry Mountains
Uinta Mountains
Wasatch Mountains
Wasatch Plateau
Book Cliffs
Roan Plateau
San Rafael Swell
Green River
Colorado River
Flaming Gorge Reservoir
Uinta and Ouray Indian Reservation
Duchesne Indian Reservation
Dugway Proving Ground
Fish Springs NWR
Ashley National Forest
Wasatch National Forest
Uinta National Forest
Fishlake National Forest
Manti-La Sal National Forest
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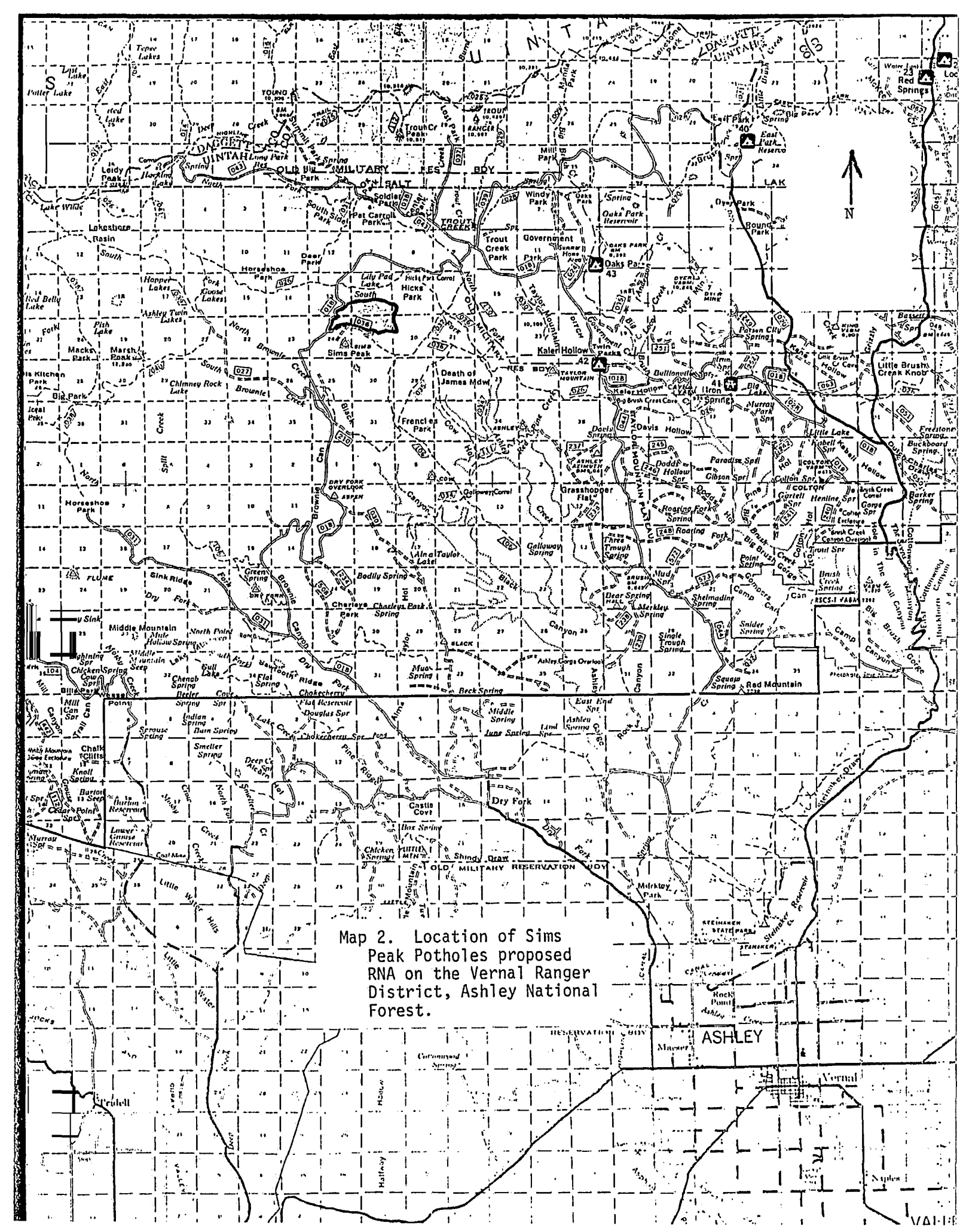
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Pat Carroll Park
Lakeshore Basin
Horseshoe Park
Deer Park
Hopper Lakes
Goose Lakes
Ashley Twin Lakes
Fish Lake
Macks Park
Marsh Peak
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Davis Hollow
Davis Spring
Murray Park Spr
Little Brush Creek Knob
Big Lake
Iron Spring
Bullionville Spr
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Grasshopper Flat
Roaring Fork
Dodds Hollow Spr
Paradise Spr
Gibson Spr
Colton Spr
Gortell Spr
Henline Spr
Brush Creek Gorge
Brush Creek Canyon Overlook
Three Trough Spring
Galloway Spring
Mud Spr
Point Spring
Gomoors Camp
Shelmadine Spring
Merkley Spring
Dear Spring
Single Trough Spring
Snider Spring
Squaw Spring
Red Mountain
Ashley Gorge Overlook
Ashley Canyon
Big Brush Canyon
Big Brush Creek Gorge
Brush Creek Spring
Trout Spr
Dry Fork Overlook
Aspen
Gallowes Corral
Cow Hollow
Ashley Twin Lakes
Ashley Peak
Bodily Spring
Green Spring
Sink Ridge
Dry Fork
Middle Mountain
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North Point
Lightning Spr
Chicken Spring
Gull Lake
Sawtooth Ridge
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Beaver Cove
Flat Reservoir
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Smelter Spring
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Chalk Cliffs
Knoll Spring
Barton Seep
Barton Reservoir
Cedar Point
Murray Spr
Lower Grouse Reservoir
Coal Mine
Middle Spring
June Spring
East End Spr
Ashley Spring
Rock Canyon
Dry Fork
Castle Cove
Box Spring
Chicken Springs
Little Mtn
Shindy Draw
Old Military Reservation
Merkley Park
Steinaker Reservoir
Steinaker State Park
Rock Point
Ashley
Maeser
Vernal
Naples
Tridell
Little White Hills
Little White Water
Halfway
Cottonwood Spring
Cottonwood Canyon
Hole in The Wall Canyon
Buckhorn Canyon
Buckboard Spring
Freestone Spring
Barker Spring
Duke Charles Draw
Kaler Hollow Cave
Kaler Hollow Corral
Big Brush Creek Cave
Ashley Gorge
Ashley Creek
Ashley Fork
Ashley Pine Ridge
Ashley Twin Lakes
Ashley Peak
Ashley Gorge Overlook
Ashley Canyon
Ashley Spring
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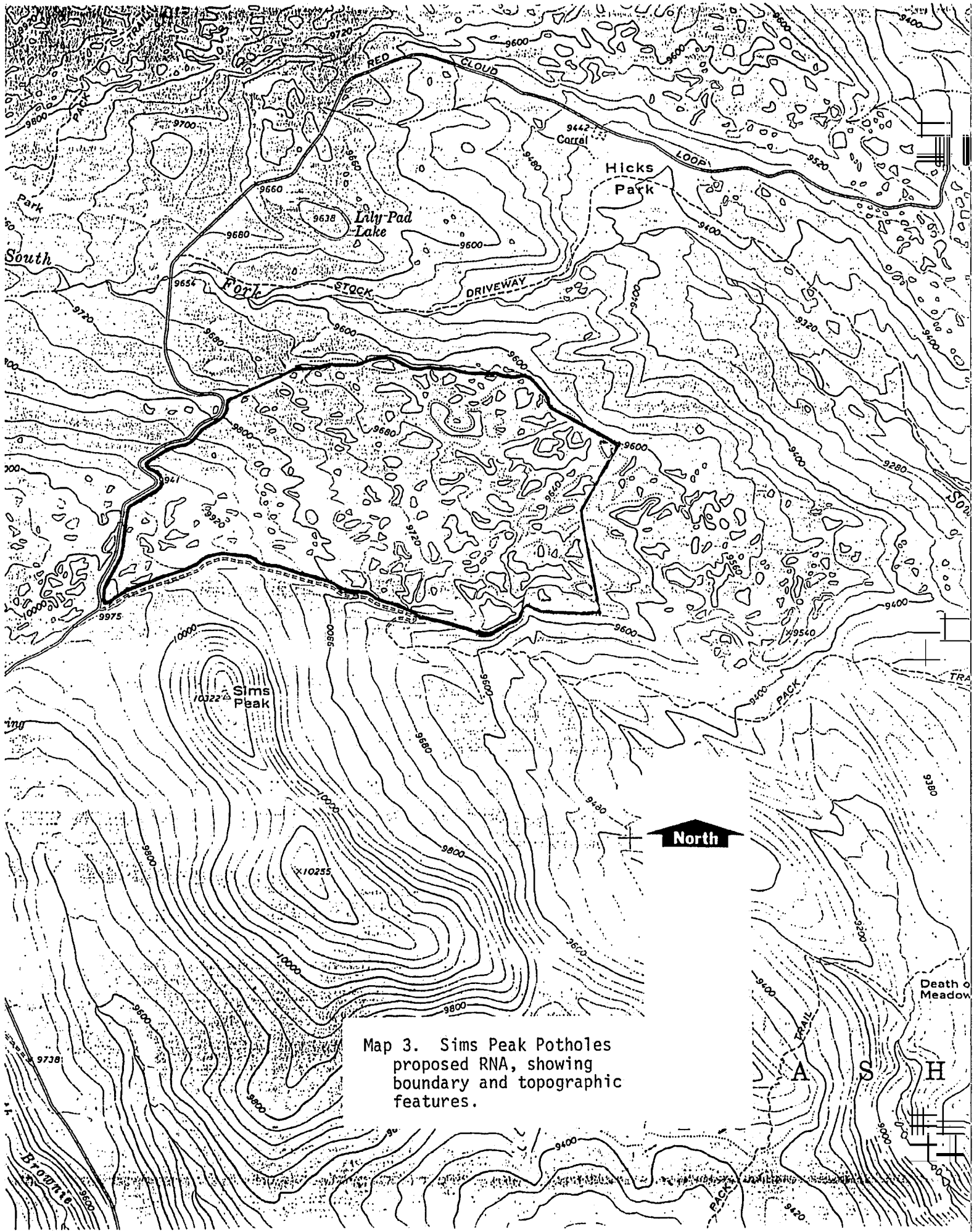

Map 3. Sims Peak Potholes proposed RNA, showing boundary and topographic features.

Key to Localities in Table 7

Flamingo Marsh.....1
Battleship Bog.....2
Leg of Lamb Pond.....3
Big Pond.....4
Black Pond.....5
Pencil Meadow.....6

Map Designation	Vegetation Type
	Abies lasiocarpa/Vaccinium scoparium habitat type.
	Ponds, marshes, bogs, meadows.

Map 4. Distribution of Vegetation Types.

USDA-FOREST SERVICE

PHOTOGRAPHIC RECORD

(See FSM 1643.52)

PHOTOGRAPHER: Joel S. Tuhy

DATE SUBMITTED: March 29, 1990

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TEMP. (1)	PERMANENT (To be filled in by the WO) (2)	(3)	(4)	(5)	(6)	(7)
				ALL: Utah Ashley NF, Vernal RD Uintah County	ALL: Sims Peak Potholes Research Natural Area	23 x 35 mm color slides
1			8/20/83		View west along the length of one of the larger potholes, in the northeastern part of the natural area.	
2			8/20/83		Western side of "Big Pond", largest body of open water in the natural area.	
3			8/20/83		A small pothole almost completely occupied by Carex rostrata (beaked sedge).	
4			8/20/83		A nearly-pure, marshy stand of Carex lasiocarpa.	
5			8/20/83		A small pond being encroached upon by vegetation, and largely rimmed by floating bog habitat.	
6			8/20/83		A close-up view of the edge of the pond in photo #5.	
7					View of a mesic meadow occupying a gently-sloping, linear forest corridor.	
8			8/20/83		View of a small pothole which contains a marshy center dominated by Carex sp.	
9			8/20/83		View of the subalpine fir/ grouse whortleberry habitat type.	

Photo 1. View west along the length of one of the larger potholes, in the northeastern part of the natural area. The high background ridges are in the vicinity of Marsh Peak, about 5 miles (8 km) distant.

Photo 2. Western side of "Big Pond", largest body of open water in the natural area. Leaves of Nuphar polysepalum (yellow waterlily) lie on the pond's surface. Dead conifers suggest that water was formerly stable at a lower level.

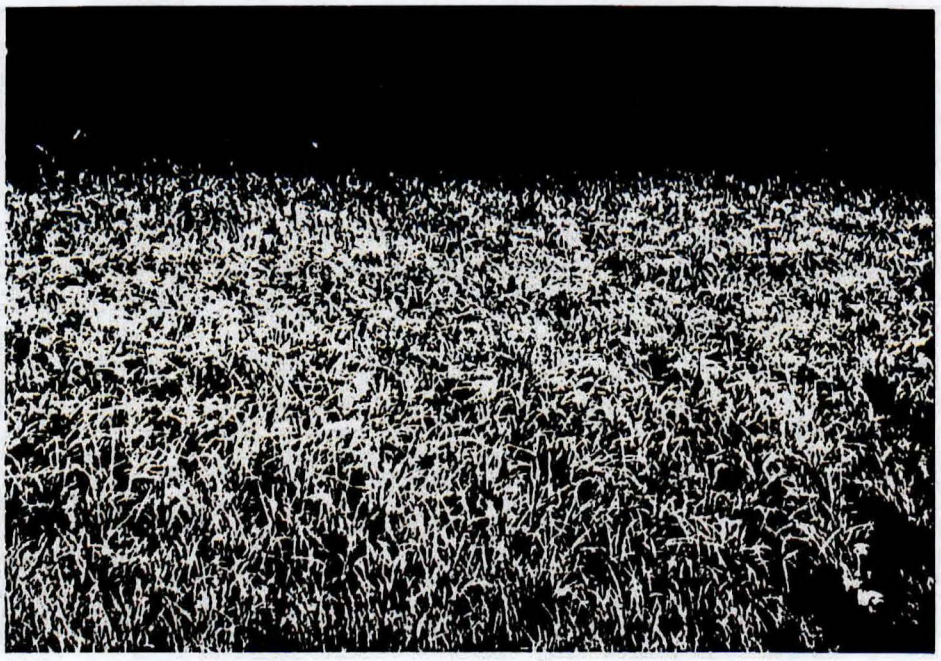

Photo 3. A small pothole almost completely occupied by Carex rostrata (beaked sedge) growing in standing water up to 1.5 feet (45 cm) deep.

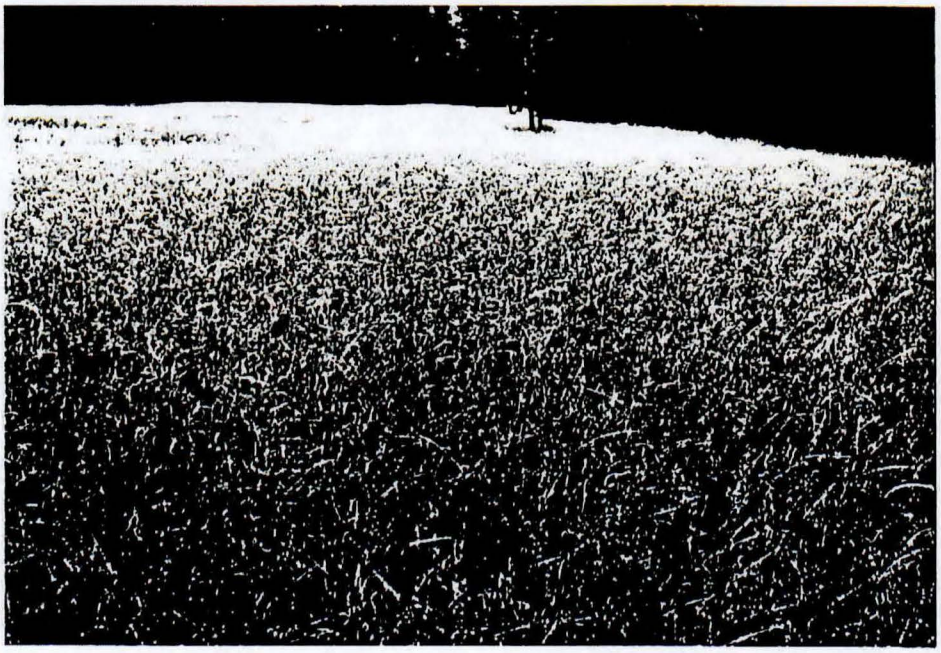

Photo 4. A nearly-pure, marshy stand of Carex lasiocarpa (woolfruit sedge) glistens with a coat of early-morning dew.

Photo 5. A small pond being encroached upon by vegetation, evidenced by the concentric rings visible to the left of the water. This particular pond is largely rimmed by floating-bog habitat. Marshy habitats dominated by Carex sp. (sedges) occupy the remainder of the pothole.

Photo 6. Close-up view of the edge of the pond pictured above. Pedicularis groenlandica (elephant's head) is flowering at upper right. Maroon flowers of Potentilla palustris (purple cinquefoil) are visible in the lower-right quadrant; stems of this species grow into water at left.

Photo 7. View of a mesic meadow occupying a gently-sloping, linear corridor through the forest. Deschampsia cespitosa (tufted hairgrass), Danthonia intermedia (timber oatgrass), and Carex microptera (small-winged sedge) are abundant. Mesic meadows are the most species-rich communities in the natural area.

Photo 8. View of a small pothole that contains a marshy center dominated by Carex sp. (upper right). This grades to wet-meadowy habitat where Calamagrostis canadensis (bluejoint reedgrass) is abundant (lower left).

Photo 9. View of the Abies lasiocarpa/Vaccinium scoparium (subalpine fir/grouse whortleberry) habitat type. This particular stand is relatively mature and not as dense as others in the natural area.

APPENDIX E

Brigham Young University
Monte L. Bean
Life Science Museum

April 30, 1984

Dr. R. Duane Lloyd
Chairman, Intermountain RNA Committee
Intermountain For. and Range Exp. Stn.
507 25th Street
Ogden, UT 84401

Dear Dr. Lloyd:

I am pleased to write a letter of recommendation in support of the proposed Sims Peak Potholes Natural Area.

Last summer was my first visit to the area and I was very impressed with the great variety of aquatic habitats in such a small geographical area at such a high elevation. The aquatic organisms that my students and I collected reinforced my interest in the area because most species were specialists that were known to occur in more northern latitudes. Several of the experts that aided me with taxonomic determinations indicated that the collecting locality must be "ideal" to contain so many rare and specialized species. A number of species records also proved to be new for the state of Utah.

The Sims Peak Potholes area serves as sort of a zoogeographical island for relictual species that generally occur in the far North or in specialized high altitude conditions. Although this statement could be made for the Uinta Mountains in general, it is probable that such a concentration of varied aquatic habitats does not occur anywhere else in the range, especially in such a limited geographic area.

This area is so wet and unevenly contoured that it probably has limited value for raising timber, recreation (fishing and hunting) and even grazing. Thus I feel that is an ideal place where a wide variety of critical aquatic habitats can be preserved as a focal point for the whole Uinta Mountain range ecosystem.

Sincerely,

Richard Baumann

Dr. Richard W. Baumann
Department of Zoology

RWB/lee